

**ABSTRACT**

An image scanning apparatus and a torsion oscillator are capable of operating across a dynamic range of possible operating frequencies. The image scanning apparatus uses a light source to produce a light beam, and the oscillator scans the light beam through a scanning pattern. The oscillator includes a plate member having a non-  
5 rectangular shape. At least one magnet is disposed on the plate. A surface of the plate member includes a reflective surface for reflecting a light beam. A frame is disposed in a spaced apart relation to a lower surface of the plate member. The frame includes at least one coil configured to induce an electromagnetic force on the at least one magnet to thereby oscillate the reflective surface to a rotational angle of oscillation at an oscillation  
10 frequency. The system also includes an imaging surface disposed in the path of the scanning pattern so that the light beam scans across the imaging surface, and a mechanical drive to move the imaging surface. A control system controls electric current provided to the at least one coil to achieve the oscillation.

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